What is Claimed is:

1. An isolated antibody specific for and immunoreactive with an isolated polypeptide comprising an amino acid sequence which is a polymorphic variant of a reference sequence for the IL4Rα protein or a fragment thereof, wherein the reference sequence comprises SEQ ID NO: 3 and the polymorphic variant is encoded by an isogene defined by one of the haplotypes shown in Table 5.

21. A method for predicting a haplotype pair for the Interleukin 4 Receptor Alpha(IL4Rα) gene of an individual comprising:

(a) identifying an IL4Rα genotype for the individual at each of PS1, PS2, PS3, PS4, PS6, PS7, PS8, PS9, PS10, PS11, PS12, PS13, PS14, PS15, PS16, PS17, PS18, PS19, PS20, PS21, PS22, PS23, PS25, PS27, PS28, PS30, PS32, PS33, PS34, PS35, PS36, PS37, PS38, PS39, PS40, PS41, PS44, and PS45;

(b) enumerating all possible haplotype pairs which are consistent with the genotype;

(c) accessing data containing the IL4Rα haplotype pairs determined in a reference population; and

(d) assigning a haplotype pair to the individual that is consistent with the data.

22. A method for identifying an association between a trait and at least one haplotype of the Interleukin 4 Receptor Alpha gene which comprises comparing the frequency of the haplotype in a population exhibiting the trait with the frequency of the haplotype in a reference population, wherein the haplotype is selected from haplotype numbers 1-53 shown in Table 5, wherein a higher frequency of the haplotype in the trait population than in the reference population indicates the trait is associated with the haplotype.

24. The method of claim 22, wherein the trait is a clinical response to a drug targeting IL4Rα.

25. A computer system for storing and analyzing polymorphism data for the Interleukin 4 Receptor Alphagene, comprising:

(a) a central processing unit (CPU);

(b) a communication interface;

(c) a display device;

(d) an input device; and

(e) a database containing the polymorphism data;

wherein the polymorphism data comprises the genotypes and haplotype pairs shown in Table 4 and the haplotypes shown in Table 5.

74

26. A genome anthology for the Interleukin 4 Receptor Alpha(IL4Rα) gene which comprises IL4Rα isogenes defined by haplotypes 1-53 shown in Table 5.

27. A method for haplotyping the Interleukin 4 Receptor Alpha (IL4Rα) gene of an individual which comprises determining whether the individual has one or more haplotypes in Table 5.